

**Target Method 4 Concept Paper**  
**BMP Based GPCD Savings Target**  
**California Department of Water Resources**  
***Draft , June 17, 2010***

## **Background**

The Water Conservation Act of 2009 (SBx7-7) requires that urban retail water suppliers set water use targets to reduce statewide per capita water use by 20% by 2020. The legislation provides 3 methods that suppliers can choose from to set a target and directs the California Department of Water Resources (DWR) to develop a fourth target method that meets the following criteria

Water Code Section 10608.20 (b) (4)

*... A method that shall be identified and developed by the department, through a public process, and reported to the Legislature no later than December 31, 2010. The method developed by the department shall identify per capita targets that cumulatively result in a statewide 20-percent reduction in urban daily per capita water use by December 31, 2020. In developing urban daily per capita water use targets, the department shall do all of the following:*

- (A) Consider climatic differences within the state.*
- (B) Consider population density differences within the state.*
- (C) Provide flexibility to communities and regions in meeting the targets.*
- (D) Consider different levels of per capita water use according to plant water needs in different regions.*
- (E) Consider different levels of commercial, industrial, and institutional water use in different regions of the state.*
- (F) Avoid placing an undue hardship on communities that have implemented conservation measures or taken actions to keep per capita water use low.*

In April, 2010 DWR convened an Urban Stakeholder Committee (USC) to provide input and guidance to DWR as it implements SBx7-7 requirements. A subcommittee of the USC (U4 Technical Subcommittee) was formed to specifically address the development of a fourth target method. Concept papers that have been submitted will be evaluated by the subcommittee. The advantages and disadvantages of each method that is proposed will be discussed based on the criteria in the law and in the subcommittee's charge. The subcommittee will meet at least 3 times and then make recommendations to the USC.

## **Concept Overview**

The method proposed in this paper would provide that an urban retail water supplier's interim and 2020 targets be based on the volume of expected water savings from implementation of the California Urban Water Conservation Council's (CUWCC) Best Management Practices (BMPs) plus the water savings from the replacement of water-using fixtures and appliances with more efficient equipment as required by current plumbing codes. Because of these measures would not be sufficient to achieve the 20% statewide reduction, and additional savings would be specified for the target.

The State's 20x2020 Water Conservation Plan predicted potential water savings by calculating statewide BMP savings. Under this proposed method, an individual urban retail water supplier (or a regional group) could take a similar approach and determine the annual volume of expected water savings from implementing the BMPs and through natural replacement of plumbing fixtures, express this volume in gpcd, and deduct it from its base daily per capita water use to derive its 2020 target. The required calculations would be the same as those required for the CUWCC's Flex Track compliance. The proposed method does not require that an urban retail water supplier achieve the target by implementing the BMPs. As with Flex Track compliance, once the target is established, the supplier can meet the target through any water conservation or water recycling program..

### **Calculation Steps**

Under this method, an urban retail water supplier would determine its interim and 2020 targets using the following steps:

- 1) Calculate the expected volume of water savings in 2015 and 2020 assuming it were to implement the foundational and programmatic BMPs according to the coverage requirements and schedules listed in Exhibit 1 of the Memorandum of Understanding (MOU) of the CUWCC.
- 2) Calculate the expected volume of water savings in 2015 and 2020 from the natural replacement of toilets, showerheads, and other water-using fixtures and appliances affected by current plumbing codes.
- 3) Add the volumes determined in 1) and 2) and convert the 2015 and 2020 totals to gpcd using its 2015 and 2020 service area population projections from its 2010 Urban Water Management Plans.
- 4) Calculate 5% of base daily per capita water use as defined in paragraph (3) of subdivision (b) of Section 10608.12.
- 5) Calculate the interim target by subtracting from its base daily per capita water use (as defined in paragraphs (1) and (2) of subdivision (b) of Section 10608.12) the 2015 gpcd amount determined in 3).

- 6) If the supplier's base daily per capita water use (as defined in paragraphs (1) and (2) of subdivision (b) of Section 10608.12) is greater than 100 gpcd, calculate the 2020 target by subtracting from its base daily per capita water use the greater of:
  - a. The 2020 gpcd amount from 3)
  - b. The gpcd amount from 4)

If the supplier's base daily per capita water use is not greater than 100 gpcd, calculate the 2020 target by subtracting from its base daily per capita water use the 2020 gpcd amount from 3).

- 7) As discussed later in this paper, the resulting targets may need to be reduced further to ensure they would cumulatively result in a 20% reduction in urban per capita water use.

### **BMP Savings Quantification**

Quantifying the expected volume of water savings from BMP implementation would need to address the following issues:

- 1) For which BMPs is it possible to estimate water savings?

Water savings from some BMPs can be estimated using reasonable assumptions. Others are much more difficult to quantify. The following table lists the BMPs for which there are water savings assumptions in the MOU or for which water savings assumptions can be developed from BMP guidance documents.

BMP	Short Description	Possible Basis for Savings Assumption
1.2 Water Loss Control	Conduct system water balance and implement water loss control program per AWWA M36 guidance	MOU does not quantify savings. Could adopt conservative estimate of 2020 savings as a percent of current system losses.
1.3 Metering with Commodity Rates	Retrofit all unmetered connections by 2012 and implement volumetric pricing	MOU assumes savings equal to 20% of pre-retrofit water use.
1.4 Retail Water Service Rates	Implement conservation rate structure and collect at least 70% of water sales revenue requirement through volumetric rates.	MOU does not quantify savings. Price elasticity estimate in CUWCC Conservation Rates Handbook could provide basis for savings assumption.

3.A.1) Residential Assistance	Provide leak detection assistance to 1.5% of SF and MF accounts per year for 10 years; 0.75% thereafter.	MOU assumes quantifiable savings. CUWCC BMP Cost & Savings Study could provide basis for savings assumption.
3.A.2)	Provide landscape surveys to 1.5% of SF accounts per year for 10 years; 0.75% thereafter.	MOU assumes quantifiable savings. CUWCC BMP Cost & Savings Study could provide basis for savings assumption.
3.A.3) HECW Incentives	Provide incentives to 1% of SF accounts per year for 10 years.	MOU assumes quantifiable savings. Savings based on HECW with water factor (WF) of 5.0.
3.A.4) WSS Toilets	Provide incentives for WSS toilets until 2014. Replicate performance of a retrofit-on-resale ordinance.	MOU assumes quantifiable savings. Existing CUWCC coverage calculator can be used to estimate savings.
4.	CII Savings	Reduce baseline CII use by 10% over 10 years. Baseline use defined as CII use in 2008. May want to use SBx7-7 base CII use instead.
5.A.1)	Provide water use budgets equal to 70% of ETo to 90% of landscape accounts with dedicated irrigation meters	MOU assumes quantifiable savings. Requires estimate of landscaped area or adoption of standard landscaped area assumption (which could possibly be developed using CUWCC data.)
5.A.2)	Survey 15% of CII accounts with mixed-use meters (or unmetered) over 10 years.	MOU assumes savings of 15-20% of pre-survey use. Requires estimate of average pre-survey use and landscaped area of surveyed accounts.

2) From what year should coverage be determined?

For most BMPs, coverage requirements depend on when an agency signed the MOU. For determining SBx7-7 targets, it would be simpler to base coverage on a fixed date, such as 2010. That would allow all urban retail water suppliers to develop BMP-based targets in the same way. These coverage calculations would not be used for purposes of MOU compliance. They would only be used to determine the SBx7-7 target.

3) Should a retail urban water supplier receive credit for previous BMP implementation?

Some BMPs allow the water supplier to take credit for previous BMP implementation when determining its coverage requirements, provided the previous implementation is documented. Credit is given on a sliding scale, with older activity receiving less credit than recent activity. A similar approach could be used to calculate the water use target. SBx7-7 requires that Method 4 avoid placing an undue hardship on communities that have implemented conservation measures or taken actions to keep per capita water use low, and credit for past BMP activity is consistent with that.

4) How would landscape BMP savings be quantified?

Estimating water savings from budgets and surveys would require knowledge of or assumptions about the average landscaped area of sites receiving budgets or surveys. Many urban retail water suppliers are unlikely to have this information. If the number of large landscapes in the service area is not large, the agency could measure landscaped area as part of target development, using techniques described for calculating water use targets under Method 2 (for reference, see the draft Methodology for Landscaped Area Water Use)

### **Flex Track and the CUWCC BMP Reporting Database**

BMP savings quantification is already required if an urban retail water supplier complies with the MOU through the Flex Track option. Under Flex Track, the water supplier may deviate from strict compliance with the BMPs provided it saves a volume of water at least equal to the expected savings from implementing the regular BMPs. Thus, the same BMP savings calculations as described above are required for Flex Track implementation.

The CUWCC is in the process of revising its BMP reporting database and website to reflect the recent BMP revisions and to accommodate the Flex Track compliance option. The revised database may include the capability for quantifying expected water savings from regular BMP implementation. If this capability is developed within the timeframe for SBx7-7 implementation, it could provide a standardized way for water suppliers to calculate their SBx7-7 target under this proposed Method.

### **Code Savings Quantification**

Methods and standardized assumptions for estimating water savings from plumbing code requirements have been developed for the CALFED Water Use Efficiency Comprehensive Evaluation, the 20x2020 report, and other studies. These estimation approaches could provide the basis for urban retail water suppliers to estimate code savings in 2015 and 2020. These approaches would need to be clearly defined in order to ensure that water suppliers implement this target method in a consistent manner. . One approach would be for DWR and/or CUWCC

to develop a code savings calculator that water suppliers would use to estimate code savings. The Alliance for Water Efficiency's Water Conservation Tracking Tool is one example of such a calculator.

### **How the Concept Addresses SBx7 7 Requirements**

SBx7- , requires that Method 4 meet several criteria. These criteria are listed below, along with an initial evaluation of how this proposed method would address them. The method shall

- 1) Cumulatively result in a statewide 20% reduction in urban per capita water use by 2020.

Information developed for the 20x2020 report was used to provide an initial estimate of annual savings that could be achieved by 2020 under this proposed method.

Implementation of the BMPs at full coverage is estimated to yield about 24 gpcd, expressed as a statewide average.<sup>1</sup> Plumbing codes are predicted to yield another 8 gpcd. Thus, savings from BMPs and codes total 32 gpcd.<sup>2</sup> This is equal to about 16.67% of the statewide baseline per capita use of 192 gpcd estimated by the 20x2020 report.<sup>3</sup> On average, the calculated volume of BMP and code savings would therefore need to be scaled up by a statewide average factor of 1.2 (20%/16.67%) before subtracting it from base daily per capita water use in order to ensure that the targets cumulatively resulted in a 20% reduction in baseline use, as required by SBx7-7. The scaling factor could be applied uniformly to all water suppliers, which is the simplest approach. Other scaling approaches that take into account baseline gpcd and historical BMP implementation could also be evaluated.

- 2) Consider climatic differences within the state.

The landscape BMPs are referenced to each urban retail water supplier's service area conditions and therefore account for climate and landscaped area water use differences across service areas. The baseline per capita reflects climatic differences and is the basis for the 2020 targets.

- 3) Consider population density differences within the state.

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<sup>1</sup> Savings from implementation of the BMPs at full coverage would be roughly equal to savings from 80% of cost-effective BMPs, grant funded BMPs, and accelerated BMP coverage shown in Table 7 of the 20x2020 Water Conservation Plan.

<sup>2</sup> Including savings from more aggressive leak detection and repair in the tally of BMP savings would increase the total savings to 38 gpcd.

<sup>3</sup> The 20x2020 report calculated statewide baseline per capita use over the period 1995-2005.

The BMP coverage requirements for surveys and device retrofits are based on the number of accounts in each service area, and thus indirectly address this requirement. Water savings for toilets, showerheads and clothes washers can be based on estimates of persons per household, and therefore can also be made to address this requirement.

- 4) Consider different levels of per capita water use according to plant water needs in different regions.

The landscape BMPs are referenced to each urban retail water supplier's service area conditions and therefore account for climate and landscape land use differences across service areas. The baseline per capita reflects plants water needs in different regions and is the basis for the 2020 targets.

- 5) Consider different levels of commercial, industrial, and institutional water use in different regions of the state.

The CII BMP is referenced to each supplier's baseline CII water use, and thus automatically accounts for differences in CII use across the state.

- 6) Avoid placing an undue hardship on communities that have implemented conservation measures or taken actions to keep per capita water use low.

The method could satisfy this requirement by adjusting the BMP coverage for past BMP implementation. Some of the BMPs already do this to some extent. Credit could be given on a sliding scale, with older activity receiving less credit than recent activity. Importantly, though, crediting for past BMP activity would require further scaling of the targets to ensure the approach would achieve a statewide reduction of 20% in per capita water use by 2020.